

AMENDMENTS TO THE DRAWINGS

The attached replacement sheets of drawings include changes to Figures 2, 4a, 4b, 7, 11, 12, 14, 15, 16a and 16b.

FIG. 2 is amended to include a bracket to indicate all of the separate elements are connected.

FIGS. 4a and 4b are herein replaced for clarity purposes, and the lines in the upper-left hand corner of FIG. 4b have been removed.

FIG. 7 is amended to remove the equation.

FIG. 11 is amended to remove identifiers R2 and R3.

FIG. 12 is amended to remove the empty unlabeled components on the left-hand side of the figure.

FIG. 14 is amended to remove identifier 108.

FIG. 15 is amended to include identifiers d1 and d2.

FIGS. 16a and 16b are amended to remove identifiers E1 and P1/P2, respectively.

REMARKS

It is respectfully submitted that, upon belief, this paper is fully responsive to the outstanding Office Action. Further, no new matter is believed to have been introduced through the various claim amendments.

Drawings

On pages 2-3 of the outstanding Office Action, the Examiner furthered a number of objections regarding the drawings.

The Drawings were objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “11” has been used to designate both outlet and cover.

The Drawings were objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign (s) mentioned in the description: 2, d₁, and d₂.

The drawings were objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 95 (Figure 8), 51 (Figure 10), R₂, R₃ (Figure 11), 102, 104, 108, 110, 112, 114, 116, 130, 140 (Figure 14), A_m, E₁, P₁, and P₂ (Figure 16b).

The drawings were objected to because in Figures 1, 10, 12 and 14, what each box represents should be fully written out (as opposed to just a reference number) to make the Figure more easily understandable since the boxes do not resemble the elements they are representing.

In Figure 2, a bracket should be drawn indicating that all of the separate elements are connected and belong in one figure as opposed to being multiple figures on the same page.

Figures 4a and 4b are hard to read and examiner is unsure what these figures are representing (i.e. what is SB, SA, SC, EA, EB, EC for example).

In Figure 7, the equation should be moved to the written description.

In Figure 12, there are empty, unlabeled components on the left hand side of the figure. Examiner is unsure what these represent.

Regarding the aforementioned rejection over FIGS 1, 10, 12 and 14, the MPEP does not require “what each box represents should be fully written out.” MPEP 608.02(d) requires that the drawings illustrate each feature that is claimed. The drawings when viewed in light of the specification are meant to apprise one of ordinary skill in the art of the embodiments of the application. If the Examiner maintains the present objection, the Examiner is respectfully requested to provide support within the MPEP for the objection.

Applicants have amended the Specification and Drawings as appropriate to overcome the aforementioned objections.

In view of the foregoing, it is respectfully requested that the objections be withdrawn.

Specification

The spacing of the lines of the specification is such as to make reading difficult. New application papers with lines 1.5 or double spaced on good quality paper are required.

It is respectfully submitted that the Specification meets the statutory requirements as it does indeed have lines with 1.5 spacing. Furthermore, one of ordinary skill in the art would be apprised of the subject matter contained therein. Accordingly, withdrawal of the objection is respectfully requested.

The specification is replete with grammatical and idiomatic errors involving spacing and noun/verb agreement.

It is respectfully submitted that the Application would apprise one of ordinary skill in the art of the various embodiments contained therein. In view of the foregoing, it is respectfully requested that the objection be withdrawn.

Claim Objections

The claims have been amended as appropriate to overcome the various objections listed on page 5 of the outstanding Office Action. In view of the foregoing, it is respectfully requested that the objection be withdrawn.

Claim Rejections - 35 U.S.C. §112

The claims have been amended as appropriate to overcome the various rejections listed on pages 6-7 of the outstanding Office Action. In view of the foregoing, it is respectfully submitted that the rejection is overcome.

Claim rejections under 35 U.S.C. §103

Claims 24-29, 32, 33 and 44-50 were rejected under 35 U.S.C. §103(a) as being unpatentable over Schoeb (US2002/0000228) in view of Makaran (US5,744,921).

The rejection is respectfully traversed.

The Examiner contends on page 8 of the Office Action that the stator of claim 24 is described by the stator (2d) of Schoeb. Applicants respectfully disagree with the Examiner's contention.

Schoeb relates to a gas forwarding apparatus for respiration and narcosis devices and describes a stator (2d) which comprises a sheet metal lamina package consisting of soft iron 2a, into the grooves of which a motor winding is inserted which can be excited by a non-illustrated controller apparatus in such a manner that a rotary field or an alternating field with a first number of pole pairs p is produced. (Schoeb, paragraph [0026]). Accordingly, Schoeb fails to describe a stator which has three separate sectors; but instead, describes a single motor winding.

However, assuming arguendo that multiple motor windings (corresponding to the at least three sectors of claim 24) are indeed described in Schoeb, the reference would still fail to describe the recitations of claim 24 because there is no teaching of "each sector's polarity configuration constituting one step of the rotor's rotation." Instead, a general description of a non-illustrated controller apparatus exciting the motor winding to create a rotary field or an alternating field is provided in Schoeb.

In contrast to the aforementioned description of Schoeb, claim 24 of the present application recites, "...said stator having at least three sectors, the rotation of the rotor being enabled by changes of the polarity of the sectors, each sector's polarity configuration constituting

one step of the rotor's rotation...“. Accordingly, Schoeb fails to teach at least the aforementioned recitation of claim 24.

The Examiner concedes that Schoeb fails to describe the recitation of claim 24 of said driving unit comprising means to sense a back electromotor force. The Examiner contends that Makaran describes said feature of claim 24. Applicants respectfully disagree with the Examiner's contention.

Makaran relates to a control circuit for a five-phase brushless dc motor which is typically used in a variety of applications including land vehicle and aerospace applications and describes five pairs of windings with a rotor mounted for rotation relative to the windings.

Firstly, a person of ordinary skill in the art would not have been motivated to combine Makaran with Schoeb as Makaran relates to brushless DC motors used in automotive engine cooling applications and in heating, ventilating and air-conditioning (HV AC) equipment rather than a medical apparatus to assist a patient respiration; and further, Makaran describes five-windings rather than three sectors.

Assuming arguendo that the combination of Makaran with Schoeb is proper, Makaran would still be an improper reference as it fails to teach or suggest at least the recitation of “said driving unit comprises means to sense a back electromotor force generated by the electromotor for changing the sector's polarity configuration when the back electromotor force reaches a zero value.”

Instead of changing the sector's polarity configuration when the back electromotor force reaches a zero value, Makaran uses a sensing circuit 106 which senses the back EMF voltages generated in motor windings 114 to determine the rotary position of the rotor 116, and if the rotor 116 is stationary or moving in a wrong direction when power is applied, the system brakes motor 102 and moves rotor 116 into a fixed position prior to energizing the windings executing a start-up sequence. (Makaran; column 7, lines 52-65; column 8, lines 15-22).

Furthermore, Makaran states that the start-up sequence energizes windings 114 in four steps. First, phase E is energized until a falling edge signal is detected by sensor E; second, phase D is energized until a falling edge signal is detected by sensor D; third, phase C is energized until a falling edge signal is detected by sensor C; and fourth, after lowering the current at step 346, phases C and D are energized for a time period. After this point, the rotor should be rotating in the correct direction. Accordingly, various windings in Makaran are energized upon a falling edge signal being detected by a respective sensor.

Conversely, as a non-limiting example, the specification of the present application states that the microcontroller 26 measures the BEMF. Further, it states that the best instant to change the phase is when the rotor 3 arrives in the optimal position, which is when the rotor magnetic field and the magnetic field between A and B are in a situation of opposite polarity. Before the rotor reaches this position, the BEMF will be positive; if the rotor passes this position, the BEMF will be negative. At the instant the rotor is at the optimal position the value of the BEMF equals

zero. Thus, when the zero value is detected on C the second microcontroller 26 sends orders to configure the switches positions to change the configuration of the stator branches polarity. Each change causes the rotor rotation. (Specification; page 8, fine 29 to page 9, line 5.).

Although the above comments are directed toward independent claim 24, they are applicable where appropriate toward the other claims (e.g., dependent claims 25-29, 32, 33 and 44-50) where appropriate. Further, separate and individual consideration of the dependent claims is respectfully requested.

Additionally, although the Examiner has not specifically stated “Official Notice” in the Office Action at pages 8-9, the Examiner contends, “Although not explicitly stated in Schoeb, it is well-known the CPAP systems deliver air through masks to patients and are often used for treating sleep apnea....” The Examiner’s contention (or taking of Official Notice) is respectfully traversed. It does not appear as if the Examiner has full appreciated the various recitations of claim 24.

Similarly, regarding claim 25, the Examiner contends, “Although Schoeb does not explicitly disclose a positive plot and a negative plot, it is well known in the field that electromotors work by alternating positive and negative current through the sectors of a stator to achieve steps for rotating the rotor....” The Examiner’s contention (or taking of Official Notice) is respectfully traversed. The Examiner is respectfully reminded that all recitations of a claim must be considered. Accordingly, the Examiner is respectfully requested to fully appreciate all of the recitations of claim 25.

Once again, regarding claim 26, the Examiner contends, “although Schoeb is silent as to pulse width modulation, Makaran discloses pulse width modulation as a well-known means of applying the tension....” The Examiner’s contention (or taking of Official Notice) is respectfully traversed. The Examiner is respectfully requested to fully appreciate all of the recitations of claim 26.

Similarly, regarding claim 27, the Examiner contends, “Although Schoeb doesn’t disclose the specifics of the magnet, dipole magnets are well-known for use as rotors in electromotors, as taught by Makaran (column 6, lines 65-67).” The Examiner’s contention (or taking of Official Notice) is respectfully traversed. The Examiner is respectfully requested to fully appreciate all of the recitations of claim 27.

Also, regarding claim 33, the Examiner contends, “the size of the tube between the blower and a patient mask is an obvious design consideration to one of ordinary skill in the art because tubes of less than 22 mm are well known in CPAP systems....” The Examiner’s contention (or taking of Official Notice) is respectfully traversed. The Examiner is respectfully requested to fully appreciate all of the recitations of claim 33.

At page 12 of the Office Action, regarding claims 46 and 47, the Examiner contends, “Examiner is assuming the applicant is referring to a diameter of less than 60 mm, which is a matter of obvious design consideration because small sized impellers are well known in the field by persons of ordinary skill in the art.” The Examiner’s contention (or taking of Official Notice) is respectfully traversed. The Examiner is respectfully requested to fully appreciate all of the recitations of claims 46 and 47.

In view of the foregoing, it is respectfully submitted that the rejection is overcome.

Claims 34-41 were rejected under 35 U.S.C. §103(a) as being patentable over Schoeb and Makaran, as applied to claim 24 above, and further in view of DeVries et al. (US5,694,926).

As this rejection is based in part over Schoeb and Makaran, the comments above with regard to claim 24 are equally applicable here for overcoming the rejection of the dependent claims. Nothing has been cited in DeVries which cures the deficiencies of Schoeb and Makaran.

In view of the foregoing, it is respectfully submitted that the rejection is overcome.

Claims 30 and 31 were rejected under 35 U.S.C. §103(a) as being patentable over Schoeb and Makaran as applied to claim 24 above, and further in view of Elrod, Jr. (US5,508,575).

As this rejection is based in part over Schoeb and Makaran, the comments above with regard to claim 24 are equally applicable here for overcoming the rejection of the dependent claims. Nothing has been cited in Elrod which cures the deficiencies of Schoeb and Makaran.

In view of the foregoing, it is respectfully submitted that the rejection is overcome.

Claim 42 was rejected under 35 U.S.C. §103(a) as being patentable over Schoeb, Makaran and DeVries, as applied to claim 34 above, and further in view of Berthon-Jones (US 6,152,129).

As this rejection is based in part over Schoeb and Makaran, the comments above with regard to claim 24 are equally applicable here for overcoming the rejection of the dependent claims. Nothing has been cited in Berthon-Jones which cures the deficiencies of Schoeb , Makaran and DeVries.

In view of the foregoing, it is respectfully submitted that the rejection is overcome.

Claim 43 was rejected under 35 U.S.C. §103(a) as being patentable over Schoeb, Makaran and DeVries, as applied to claim 34 above, and further in view of Hill et al (US6,401,713).

As this rejection is based in part over Schoeb and Makaran, the comments above with regard to claim 24 are equally applicable here for overcoming the rejection of the dependent claims. Nothing has been cited in Hill which cures the deficiencies of Schoeb, Makaran and DeVries.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

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Amendment
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If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



Joseph W. Iskra
Attorney for Applicants
Registration No. 57,485
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

SGA/JWI/af